



Nuclear Waste Transportation Risks: Stakeholder Information Needs

Bob Halstead
Transportation Advisor
State of Nevada
Agency for Nuclear Projects
Presentation to

**U.S. DOE, Office of Civilian
Radioactive Waste Management
Spent Nuclear Fuel and High-Level
Radioactive Transportation
Workshop**

Reston, Virginia
August 12, 1997

Nuclear Waste Transportation Risks: Stakeholder Information Needs

- Transportation Logistics
- Non-Radiological Risks
- Radiological Risk Assumptions
- Routine Radiological Risks
- Non-Routine Radiological Risks
- Risk Management Strategies

Stakeholder Information Needs

Transportation Logistics

- SNF and HLW Quantities
- Transportation Service Plans
- Shipment Origins and Destinations
- Mode and Cask Options
- Most Likely Shipment Numbers
- Most Likely Highway Routes
- Most Likely Rail Routes
- Most Likely Total Shipment Miles
- Transportation System Costs
- Alternative Scenarios

Stakeholder Information Needs
Non- Radiological Risks

- Expected Accident and Incident Rates for Legal-Weight Truck Shipments
- Expected Accident and Incident Rates for Rail Shipments (General Freight and Dedicated Trains)
- Expected Accident and Incident Rates for Heavy Haul Truck or Barge Shipments
- Expected Life of Operations Accidents and Incidents By Mode
- Expected Life of Operations Non-radiological Accident Fatalities , Injuries, and Economic Impacts

Stakeholder Information Needs

Radiological Risk Assumptions

- Radiological Characteristics of SNF and HLW
- Radiation Health Effects
- Potential Exposures from Routine Operations
- Potential Exposures and Releases from Very Severe Accidents
- Potential Exposures and Releases from Terrorist Attack involving Breach of Cask

Stakeholder Information Needs

Routine Radiological Risks

- Potential Health Effects to Transportation Workers
- Potential Health Effects to Residents along Shipping Routes
- Potential Health Effects to Motorists Travelling near Shipments
- Potential Health Effects to Motorists Stuck in Gridlock Incidents
- Perceived Risks of Radiation from Routine Transportation Operations

Stakeholder Information Needs

**Non-Routine
Radiological Risks**

- Probability and Consequences of Severe Truck Accident Resulting in Release
- Probability and Consequences of Severe Rail Accident Resulting in Release
- Probability and Consequences of Terrorist Attack involving Breach of a Truck Shipping Cask
- Probability and Consequences of Terrorist Attack involving Breach of a Rail Shipping Cask
- Perceived Risks of Radiation from Severe Accidents and Terrorism

Stakeholder Information Needs

Risk Management Strategies

- Contractor/Carrier Selection
- Safety Regulations
- Security Regulations
- Emergency Response Plans
- Extra-Regulatory Safety and Security Measures
- Human Factors Engineering
- Probabilistic Approaches to Risk Management
- Liability and Compensation

Common Sense Principles of Transport

- **Low Population Routing**
- **Rail or Barge vs. Truck Transportation**
- **Minimal Direct Handling of Bare SNF**
- **Minimal Moves Necessary**
- **Send Expertise Along**
- **State of the Art Technology**